

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

ROBIN M. MILLER

Serial No.: 09/090,071

Filed: June 3, 1998

For: HEADS-UP DISPLAY WITH IMPROVED CONTRAST

Attorney Docket No.: LUTA 0177 PUS



Group Art Unit: 2774

Examiner: Kevin M. Nguyen

28 / Appeal
Brief
2-6-03
NP

SUPPLEMENTAL APPEAL II BRIEF UNDER 37 C.F.R. § 1.192

Box AF
Commissioner for Patents
United States Patent and Trademark Office
Washington, D.C. 20231

Sir:

This Supplemental Appeal Brief II is in support of an appeal from the final rejection of claims 18 and 20 in the final Office Action mailed on September 13, 2002.

CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8

I hereby certify that this paper, including all enclosures referred to herein, is being deposited with the United States Postal Service as first-class mail, postage pre-paid, in an envelope addressed to: BOX AF, Commissioner for Patents, U.S. Patent and Trademark Office, Washington, D.C. 20231 on:

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James N. Kallis
Name of Person Signing

[Signature]
Signature

I. Real Party In Interest

The real party in interest is Lear Automotive Dearborn, Inc., a corporation organized and existing under the laws of the state of Delaware, and having a place of business at Southfield, Michigan, as set forth in the assignment recorded in the U.S. Patent and Trademark Office on July 9, 1999 at Reel 010061, Frame 0393.

II. Related Appeals and Interferences

There are no other appeals or interferences known to the Applicant, the Applicant's legal representative, or the Assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. Status of Claims

Claims 18 and 20 (reproduced for reference in the attached Appendix) are pending in this application and are on appeal.

IV. Status of Amendments

In response to the final Office Action mailed on September 13, 2002, the Applicant filed herewith an Amendment After Final cancelling claims 5-8, 12, 19, and 21. There were no other amendments subsequent to the final Office Action.

V. Summary of Invention

As generally described on page 2, lines 1-18; page 4, line 20 through page 6, line 7; and FIGS. 3A and 3B of the Applicant's disclosure, the claimed invention includes a system and method for controlling the contrast of a vehicle heads-up display

(HUD) (36) displayed onto a windshield (22) of a moving vehicle (20) relative to an environmental image (30, 34, 42) approaching the vehicle. The system and method capture the image of the environment approaching the vehicle. The system and method then improve the contrast of the HUD in response to the captured environmental image by selecting an appropriate pattern (36, 44) for the HUD dependent upon the captured environmental image.

In some situations, there are environmental factors that affect the visibility or clarity of the HUD. For example, as illustrated in the drawings, the visibility of the HUD displayed on the interior surface of the windshield may be affected, for instance, by environmental images produced by a gravel road (34) (FIG. 3A) or elongated crops (42) (FIG. 3B), or by an approaching vehicle such as a large red truck (37) (FIG. 2B). The system and method compensate for these environmental factors in order to improve the contrast of the HUD relative to these environmental factors by controlling the pattern of the HUD dependent upon the environmental factors.

For example, in the case of an environmental image produced by a gravel road (34), the pattern of the HUD may be selected to be elongated bars (36) in order to improve the clarity of the HUD relative to the gravel road. (See page 5, lines 16-20; and FIG. 3A of the Applicant's disclosure.) Similarly, in the case of an environmental image produced by elongated crops (42), the pattern of the HUD may be selected to be dots (44) in order to improve the clarity of the HUD relative to the elongated crops. (See page 5, lines 21-23 and FIG. 3B of the Applicant's disclosure.)

VI. Issues

The Examiner finally rejected claims 18 and 20 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,005,009 issued to Roberts ("Roberts") in view of U.S. Patent No. 5,343,206 issued to Ansaldi et al. ("Ansaldi") in further view of U.S. Patent No. 4,405,940 issued to Woolfson et al. ("Woolfson"). The Examiner finally rejected claims 18 and 20 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,969,969 issued to Ejiri et al. ("Ejiri") in view of Woolfson.

The issues on appeal are:

1) whether Roberts in view of Ansaldi in further view of Woolfson makes a *prima facie* showing of obviousness of claims 18 and 20; and

2) whether Ejiri in view of Woolfson makes a *prima facie* showing of obviousness of claims 18 and 20.

VII. Grouping of Claims

Claims 18 and 20 stand or fall by themselves.

VIII. Argument

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. MPEP 2143. The teaching or suggestion to make the claimed

combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

1. Background of the Claimed Invention

As described on page 1, lines 1-17 of the Applicant's specification, a heads-up display (HUD) is directed onto the windshield of a vehicle in order to display information for a vehicle operator. Information typically displayed by the HUD is the speed of the vehicle. As the HUD is displayed onto the vehicle windshield, the background of the HUD includes the oncoming surroundings of the vehicle. For instance, the background of the HUD includes the road, trees, sky, other vehicles, etc., ahead of the vehicle, i.e., the background of the HUD is the scene viewed by the vehicle operator as the vehicle operator looks through the windshield ahead of the vehicle.

In some situations, there may be an arrangement of environmental factors in the background that make the HUD difficult for the vehicle operator to see or distinguish from the background. For example, the visibility of the HUD be affected by a background produced by a gravel road (34) (FIG. 3A) or elongated crops (42) (FIG. 3B). As such, if the HUD is formed of the same or similar pattern as the pattern of the background, then the HUD may be difficult for the vehicle operator to see. Accordingly, a method and system for improving the vehicle operator visibility of a HUD displayed on a vehicle windshield are needed.

2. The Claimed Invention

The claimed invention, as recited in independent claims 18 and 20, satisfies the above-described need. Independent claim 18 provides a heads-up display (HUD) system and independent claim 20 provides an associated method. The system includes a source for providing an HUD onto a windshield of a moving vehicle. The system further includes an arrangement for controlling the contrast of the HUD relative to an environmental image approaching the moving vehicle. The arrangement includes an optical detector for capturing the image of the environment approaching the vehicle and a control coupled to the optical detector for controlling the contrast of the heads-up display in response to the environmental image approaching the moving vehicle. The control selects an appropriate pattern for the heads-up display dependent upon the captured environmental image.

As such, the system compensates for factors in the environmental image in order to improve the contrast of the HUD relative to the environmental image by controlling the pattern of the HUD dependent upon the environmental image. For example, in the case of a gravel road environmental image (34), the pattern of the HUD may be selected to be elongated bars (36) in order to improve the clarity of the HUD relative to the gravel road. Similarly, in the case of an elongated crop environmental image (42), the pattern of the HUD may be selected to be dots (44) in order to improve the clarity of the HUD relative to the elongated crops.

**Issue 1: Whether the combination of Roberts, Ansaldi, and Woolfson makes a
prima facie case of obviousness of claims 18 and 20**

A. The Prior Art References

In the Advisory Action mailed on November 27, 2002, the Examiner summarized Roberts as teaching a vehicle HUD and summarized Ansaldi and Woolfson as teaching a camera that controls and selects the pattern and the color contrast of the HUD in response to the environmental image approaching the vehicle.

In the final Office Action, the Examiner posited that Roberts teaches the claimed invention with the exception of "an arrangement for controlling the contrast of the heads up display [relative] to an environmental image approaching the moving vehicle wherein the arrangement includes an optical detector for capturing the image of the environment approaching the moving vehicle and a control coupled to the optical detector for controlling the contrast of the heads up display in response to the environment image approaching the moving vehicle."

The Examiner cited Ansaldi which teaches an anti-collision vehicle system having an HUD displaying an environmental image of a road situation with possible obstacles (such as other vehicles too close) being colored.

The Examiner noted that Roberts and Ansaldi fail to teach "an arrangement for controlling the contrast of the heads-up display relative to an environmental approaching the moving vehicle." The Examiner posted that Woolfson teaches a related HUD system having a video camera and television screen in which a target (11) is discriminated against the background on the basis of mass intensity contrast, and is further discriminated against the background based on relative motion (environment) connecting via controller 3 and a video tracker 2. As indicated in the Abstract, Woolfson teaches a

video signal preprocessor for discriminating a target image from background in the video frame signals.

B. The Claimed Invention Compared to the Prior Art References

The claimed invention is different than any combination of Roberts, Ansaldi, and Woolfson in that the claimed invention controls the contrast of the HUD relative to the environmental image approaching the moving vehicle by selecting an appropriate pattern as a function of the environmental image in order to improve the visibility and contrast of the HUD for the vehicle operator. That is, the claimed invention selects an appropriate pattern for the HUD in order to enable the vehicle operator to distinguish the HUD from the environmental image, i.e., background of the HUD.

Roberts discloses an HUD. Ansaldi uses radar to generate a map of the surroundings of a vehicle (see FIG. 6 of Ansaldi). In the map, Ansaldi displays objects representing possible obstacles with a different color such as red or yellow than the colors of the other objects displayed in the map. The purpose of the coloring difference is to draw the vehicle operator's attention to possible obstacles such as other vehicles traveling too close to the vehicle operator's vehicle.

Significantly, the obstacles displayed with a different color on the map are actually part of the environmental image surrounding the vehicle as opposed to an independent image (i.e., HUD) being displayed on the map (i.e., windshield). As such, combining Roberts and Ansaldi would result in changing the color of objects in the environmental image as opposed to changing the color of the HUD to distinguish the HUD from the environmental image. Further, unlike the claimed invention, Ansaldi does not teach or suggest displaying objects with an appropriate pattern selected as a function of the other objects in the map (i.e., environmental image) in order to distinguish the objects representing obstacles from the other objects in the map.

Woolfson teaches a video signal preprocessor for discriminating a target image from background in a video frame. Like Ansaldi, the target image to be discriminated is actually part of the video frame as opposed to an independent image (i.e., HUD) being displayed on a projection of the video frame (i.e., windshield). As such, combining Roberts and Woolfson would result in discriminating an object in the environmental image from other objects in the environmental image as opposed to discriminating the HUD from the environmental image. Further, unlike the claimed invention, Woolfson does not teach or suggest discriminating the target image by selecting an appropriate pattern for the target image as a function of the background in the video frame (i.e., environmental image) in order to distinguish the target image from the background in the video frame. In contrast, Woolfson teaches using gray scales in order to provide for the discrimination of the target image.

Thus, the claimed invention differs from any combination of Roberts, Ansaldi, and Woolfson by selecting an appropriate pattern for the HUD as a function of the environmental image approaching the vehicle in order to improve the contrast of the HUD relative to the environmental image. Accordingly, claims 18 and 20 are patentable under 35 U.S.C. § 103(a) over Roberts, Ansaldi, and Woolfson.

Issue 2: Claims 18 and 20 Rejected Under 35 U.S.C. § 103(a)

In View Of Ejiri and Woolfson

A. The Prior Art References

In the Advisory Action, the Examiner summarized Ejiri as teaching a vehicle HUD and summarized Woolfson as teaching a camera that controls and selects the pattern and the color contrast of the HUD in response to the environmental image approaching the vehicle.

In paragraph 13 of the final Office Action, the Examiner posited that Ejiri teaches the claimed invention with the exception of an arrangement for controlling the contrast of the HUD relative to an environmental image approaching the moving vehicle. As indicated above, the Examiner posited that Woolfson teaches discriminating the target based on relative motion.

B. The Claimed Invention Compared To The Prior Art References

The claimed invention is different than any combination of Ejiri and Woolfson in that the claimed invention controls the contrast of the HUD relative to the environmental image approaching the moving vehicle by selecting an appropriate pattern as a function of the environmental image in order to improve the visibility and contrast of the HUD for the vehicle operator. That is, the claimed invention selects an appropriate pattern for the HUD in order to enable the vehicle operator to distinguish the HUD from the environmental image, i.e., background of the HUD.

Ejiri discloses a HUD in which objects are displayed with black circles and no objects are displayed with white circles. (See paragraph 13 of the final Office Action.)

As indicated above, Woolfson teaches a video signal preprocessor for discriminating a target image from background in a video frame. The target image to be discriminated is actually part of the video frame as opposed to an independent image (i.e., HUD) being displayed on a projection of the video frame (i.e., windshield). As such, combining Ejiri and Woolfson would result in discriminating an object in the environmental image from other objects in the environmental image as opposed to discriminating the HUD from the environmental image. Further, unlike the claimed invention, Woolfson does not teach or suggest discriminating the target image by selecting an appropriate pattern for the target image as a function of the background in the video

frame (i.e., environmental image) in order to distinguish the target image from the background in the video frame.

Thus, the claimed invention differs from any combination of Ejiri and Woolfson by selecting an appropriate pattern for the HUD as a function of the environmental image approaching the vehicle in order to improve the contrast of the HUD relative to the environmental image. Accordingly, claims 18 and 20 are patentable under 35 U.S.C. § 103(a) over Ejiri and Woolfson.


IX. Summary

For the reasons above, the Applicant urges the Board of Patent Appeals and Interferences to find that claims 18 and 20 are nonobvious under 35 U.S.C. § 103(a) over the combination of Roberts, Ansaldi, and Woolfson and over the combination of Ejiri and Woolfson.

No fee as applicable under the provisions of 37 C.F.R. § 1.17(c) is enclosed. With reference to M.P.E.P. § 1208.02, the Applicant understands that "whether Appellant elects to continue prosecution or to request reinstatement of the Appeal, if prosecution was reopened prior to a Decision on the Merits by the Board of Patent Appeals and Interferences, the fee paid for the Appeal Brief . . . will be applied to a later Appeal on the same application" (modifications added). As such, the Applicant has not included any fees with this Supplemental Appeal Brief II. However, if the Applicant is incorrect in the calculation of fees due in connection with this filing, the Commissioner is authorized to charge any deficiencies or credit any overpayments to our Deposit Account No. 02-3978.

Respectfully submitted,

ROBIN MILLER



James N. Kallis
Reg. No. 41,102
Attorney for Applicant

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BROOKS & KUSHMAN P.C.
1000 Town Center, 22nd Floor
Southfield, MI 48075
Phone: 248-358-4400
Fax: 248-358-3351

Attachment: Appendix

APPENDIX

18. A vehicle heads-up display system comprising:

a source for providing a heads-up display onto a windshield of a moving vehicle; and

an arrangement for controlling the contrast of the heads-up display relative to an environmental image approaching the moving vehicle wherein the arrangement includes an optical detector for capturing the image of the environment approaching the vehicle and a control coupled to the optical detector for controlling the contrast of the heads-up display in response to the environmental image approaching the moving vehicle; and

wherein the control selects an appropriate pattern for the heads-up display dependent upon said captured image.

20. A method of providing a heads-up display comprising the steps of:

(a) providing a system for directing a heads-up display onto the windshield of a moving vehicle;

(b) directing a heads-up display onto the vehicle windshield; and

(c) controlling the contrast of the heads-up display relative to an environmental image approaching the moving vehicle wherein the steps of controlling includes the step of capturing the image of the environment approaching the moving vehicle and controlling the contrast of the heads-up display in response to the

environmental image captured and selecting an appropriate pattern for the heads-up display dependent upon said captured image.